CLAIMS

What is claimed is:

1. A method of preventing eating disorders or treating patients with eating disorders, comprising:

implanting at least one system control unit in at least one of the skull and the brain of the patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one area of the brain affecting at least one eating disorder;

applying the at least one stimulus to the at least one area of the brain that exhibits chronic abnormal activity, in order to prevent or treat the at least one eating disorder,

wherein the area is selected from at least one of the arcuate nucleus, the dorsomedial nucleus, and the nucleus of the solitary tract.

2. The method of Claim 1 wherein the at least one system control unit is connected to at least two electrodes, and wherein the stimulus comprises electrical stimulation delivered via the at least two electrodes.

3. The method of Claim 1 wherein the at least one system control unit is connected to at least one pump and at least one infusion outlet, and wherein the stimulus comprises stimulation via one or more drugs delivered from the at least one pump through the at least one outlet.

4. The method of Claim 1 wherein the at least one system control unit is connected to at least two electrodes and to at least one pump and at least one infusion outlet, and wherein the stimulus comprises both electrical stimulation delivered via the at least two electrodes and stimulation via one or more drugs delivered from the at least one pump through the at least one outlet.

5. The method of Claim 1 wherein implanting at least one system control unit comprises implanting at least one microstimulator.

6. A method for preventing eating disorders or treating patients with eating disorders, comprising:

implanting at least one system control unit in at least one of the skull and the brain of the patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one area of the brain affecting at least one eating disorder;

applying the at least one stimulus to the at least one area of the brain in order to prevent or treat the at least one eating disorder,

wherein the at least one area of the brain is at least one of the arcuate nucleus, the paraventricular nucleus, the dorsomedial nucleus, and the nucleus of the solitary tract.

7. The method of Claim 6 wherein the stimulus modulates the secretion of NPY by the NPY-secreting cells of the arcuate nucleus.

8. The method of Claim 6 wherein the stimulus modulates the effect of NPY on at least one of the paraventricular nucleus and the dorsomedial nucleus.

9. The method of Claim 6 wherein the stimulus modulates the production of AGRP by the AGRP-producing cells of the arcuate nucleus.

10. The method of Claim 6 wherein the stimulus modulates the effect of AGRP on at least one of the paraventricular nucleus, the dorsomedial nucleus, and the arcuate nucleus.

11. The method of Claim 6 wherein the stimulus modulates the effect of at least one of MC4-R and MC3-R on at least one of the paraventricular nucleus, the dorsomedial nucleus, and the arcuate nucleus.

12. The method of Claim 6 wherein the stimulus modulates the effect of orexins on at least the paraventricular nucleus.

13. The method of Claim 6 wherein the stimulus modulates the effect of at least one catecholamine on at least one of the paraventricular nucleus and the dorsomedial nucleus.

14. The method of Claim 6 wherein the stimulus modulates the secretion of corticotropin-releasing factor by the arcuate nucleus.

15. The method of Claim 6 wherein the stimulus modulates the secretion of at least one of gonadotropin-releasing hormone, luteinizing hormone releasing hormone, and thyrotropin releasing hormone by the arcuate nucleus.

16. The method of Claim 6 wherein the stimulus is at least one stimulating drug.

17. The method of Claim 6 wherein the stimulus is electrical stimulation.

18. The method of Claim 6 wherein the stimulus is electrical stimulation and at least one stimulating drug.

19. The method of Claim 6 further comprising applying the stimulus in coordination with delivery of a medication.

20. The method of Claim 6 further comprising sensing at least one condition and using the at least one sensed condition to automatically determine the stimulus to apply.

21. The method of Claim 6 further comprising implanting more than one system control unit.

22. The method of Claim 6 wherein implanting at least one system control unit comprises implanting at least one microstimulator.

23. A system for preventing eating disorders or treating patients with eating disorders, comprising:

at least one system control unit configured to be implanted in at least one of the skull and the brain of the patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one area of the brain affecting at least one eating disorder; and

at least one sensor in communication with the at least one system control unit and configured to sense at least one condition indicating a need for said stimulus in order to treat or prevent the at least one eating disorder;

wherein the at least one sensed condition is at least one of body mass, impedance, pH, electrical activity of the brain, nerve activity, muscle activity, neurotransmitter level, neurotransmitter breakdown product level, hormone level, ketone level, glucose level, electrolyte level, enzyme level, cytokine level, medication level, other drug level, and level of any other bloodborne substance.

24. The system of Claim 23 wherein the at least one sensed condition is the level of one or more of Neuropeptide Y (NPY), serotonin, one or more catecholamines, adrenocorticotrophic hormone (ACTH), luteinizing hormone (LH), follicle-stimulating hormone (FSH), growth hormone (GH), thyroid stimulating hormone (TSH), leptin, ghrelin, AGRP, orexin-A, orexin-B, cholecystokinin (CCK), glucagon, and glucocorticoids.

25. The system of Claim 23 wherein the at least one system control unit is configured to use the sensed condition to control the delivery of the at least one stimulus.

26. The system of Claim 23 further comprising:

at least one pump;

at least one infusion outlet; and

fluid connections connecting the at least one pump to the at least one infusion outlet;

wherein the system is configured to deliver the stimulus as at least one stimulating drug to the at least one area of the brain in order to treat or prevent the at least one eating disorder; and

wherein the at least one area of the brain is at least one of the arcuate nucleus, the dorsomedial nucleus, the nucleus of the solitary tract, ventromedial nucleus, the paraventricular nucleus, and the lateral hypothalamic area.

27. The system of Claim 26 wherein the at least one pump and the at least one infusion outlet are further configured to deliver a liquid that increases excitement of the at least one area of the brain that exhibits chronic decreased activity.

28. The system of Claim 27 wherein the at least one pump and the at least one infusion outlet are further configured to deliver at least one of an excitatory neurotransmitter agonist, a medication that increases levels of at least one excitatory neurotransmitter, an excitatory hormone agonist, an inhibitory neurotransmitter antagonist, an inhibitory hormone antagonist, corticotropin releasing factor, a corticotropin releasing factor agonist, bombesin, a bombesin agonist, glucagon-like peptide 1, a glucagon-like peptide 1 agonist, serotonin, a serotonin agonist, leptin, a leptin agonist, a ghrelin antagonist, an AGRP antagonist, an MC4-R agonist, an MC3-R agonist, an orexin-A antagonist, an orexin-B antagonist, an OX1R antagonist, an OX2R antagonist, cholecystokinin, and a cholecystokinin agonist.

29. The system of Claim 26 wherein the at least one pump and the at least one infusion outlet are further configured to deliver a liquid that decreases excitement of the at least one area of the brain that exhibits chronic increased activity.

30. The system of Claim 29 wherein the at least one pump and the at least one infusion outlet are further configured to deliver at least one of an inhibitory neurotransmitter agonist, a medication that increases the level of an inhibitory

neurotransmitter, an inhibitory hormone agonist, an excitatory neurotransmitter antagonist, and/or an excitatory hormone antagonist.

31. The system of Claim 23 further comprising:

at least two electrodes configured to apply electrical stimulation to the at least one area of the brain in order to prevent or treat the at least one eating disorder; and

electrical connections connecting the at least one system control unit to the at least two electrodes and through which the electrical stimulation is delivered to the at least one area adjacent to the electrodes;

wherein the at least one area of the brain is at least one of the arcuate nucleus, the dorsomedial nucleus, and the nucleus of the solitary tract.

32. The system of Claim 23 wherein the system control unit is configured to conform to the profile of the skull.

33. The system of Claim 23 wherein the at least one system control unit is at least one microstimulator.